120

AF/2632

Attorney Docket No. ATI-244

#16

6-4-04

UNITED STATES PATENT AND TRADEMARK OFFICE

Examiner: Tai T. Nguyen Art Unit: 2632

Re:	Application of:	David S. Breed et al.
	Serial No.:	09/851,362
	Confirmation No.:	2373
	Filed:	May 8, 2001
	For:	Vehicular Blind Spot Identification and Monitoring System
	Customer Number:	22846

APPEAL BRIEF UNDER 37 C.F.R. §1.192

Commissioner for Patents
P.O. Box 1450
Arlington, VA 22313-1450

May 3, 2004

Dear Sir:

On February 27, 2004, appellants, through their attorney, appealed from the final rejections of claims 1-6, 8-20 and 22-31 set forth in an Office Action dated August 27, 2003 for the above-referenced application. The Notice of Appeal was received on March 1, 2004, and therefore this Appeal Brief is being timely within two months from the date of the Notice of Appeal.

This Appeal Brief is submitted in triplicate by the appellants in support of the patentability of claims 1-6, 8-20 and 22-31 of this application. For the reasons set forth below, it is believed that the rejections in the Office Action dated August 27, 2003 should be reversed.

05/07/2004 JWORDOF1 00000038 500266 09851362
01 FC:2402 165.00 DA

FIRST CLASS MAIL CERTIFICATION
I hereby certify that this amendment is being deposited with the United States Postal Service as first class mail in a postage-paid envelope addressed to the Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on May 3, 2004.

Brian Roffe

A. REAL PARTY IN INTEREST

The real party in interest of the above-identified application is Automotive Technologies International, Inc., by virtue of an assignment of 100% interest in the application by the inventor-appellants.

B. RELATED APPEALS AND INTERFERENCES.

At this time, there are no related appeals or interferences.

C. STATUS OF CLAIMS

Claims 1-6, 8-20 and 22-31 are pending in this application and all have been rejected. Claims 7 and 21 have been cancelled. Appellants are therefore appealing the final rejections of claims 1-6, 8-20 and 22-31.

Claim 1 is an independent claim upon which claims 2-6, 8-18 and 30 depend directly or indirectly and claim 19 is a second independent claim upon which claims 22-29 and 31 depend directly or indirectly. The text of the claims on appeal is found in Appendix 1.

D. STATUS OF AMENDMENTS FILED SUBSEQUENT TO FINAL REJECTIONS

An Amendment Under 37 C.F.R. §1.116 was filed on December 15, 2003. In an Advisory Action mailed March 10, 2004, the Examiner indicated that the Amendment would not be entered because it raised new issues that would require further consideration and/or search. In the Advisory Action, the Examiner also mentioned that the Amendment did not place the application in condition for allowance because the limitation of the processor being arranged to create a three-dimensional representation of a portion of the environment surrounding the vehicle is similar to the McEwan patents (US 5457394 and US 5521600). However, in a conversation with the Examiner, it was pointed out that the McEwan patents

are not "of record" and therefore, the Examiner's comments are out of place and will not be considered for the purposes of this appeal.

E. SUMMARY OF THE INVENTION

The present invention as defined in claim 1 relates to an arrangement for obtaining information about objects in an environment around a vehicle including light emitting means (110-114) arranged on the vehicle for emitting infrared light into the environment around the vehicle, receiver means (110-114) arranged on the vehicle for receiving infrared light from the environment around the vehicle and measurement means (120) coupled to the light emitting means and the receiver means for measuring time between emission of the infrared light by the light emitting means and reception of the infrared light by the receiver means whereby the measured time correlates to distance between the vehicle and an object from which the infrared light is reflected. A processor (120) is coupled to the receiver means (110-114) and determines an identification of the object from which light is reflected based at least in part on the received infrared light.

The present invention as defined in claim 19 relates to a system for controlling a vehicular system based on the presence of an object in an environment around a vehicle including an arrangement for obtaining information about the object including light emitting means (110-114) arranged on the vehicle for emitting infrared light into the environment around the vehicle and receiver means (110-114) arranged on the vehicle for receiving infrared light from the environment around the vehicle and obtaining at least one image of the environment around the vehicle. A vehicular system is adapted to be controlled or adjusted upon the determination of the presence of an object in the environment around the vehicle and the identification of the object (see page 36, lines 15-25). A processor (120) is coupled to the arrangement and processes the image(s) obtained by the receiver means and determines the identification of any objects therein. The processor (120) controls the vehicular system based at least in part on the determined identification of the object.

F. ISSUES

The issues presented on this appeal are as follows:

1. Whether it would have been obvious or even possible for a person having ordinary skill in the art at the time the invention was made to combine purported teachings of Scully (US. Patent No. 6,363,326) and Uehara (U.S. Patent No. 5,808,728) and arrive at the embodiments of the invention set forth in claims 1-4, 8-18 and 30.

2. Whether it would have been obvious or even possible for a person having ordinary skill in the art at the time the invention was made to combine purported teachings of Scully, Uehara and Spies (U.S. Patent No. 5,247,296) and arrive at the embodiments of the invention set forth in claims 19, 20, 22, 23, 25-29 and 31.

3. Whether it would have been obvious or even possible for a person having ordinary skill in the art at the time the invention was made to combine purported teachings of Scully, Uehara and Smith et al. (U.S. Patent No. 6,281,806) and arrive at the embodiments of the invention set forth in claims 5 and 6 and combine purported teachings of Scully, Uehara, Spies and Smith et al. and arrive at the embodiment of the invention set forth in claim 24.

G. GROUPING OF CLAIMS

Claims 1-6, 8-20 and 22-31 do not stand or fall together. Rather, claims 1-4, 8 and 13-18 stand or fall together (a first group), claims 19, 20, 22, 28, 29 and 31 stand or fall together (a second group), claims 9 and 23 stand or fall together (a third group), claims 10-12 and 25-27 stand or fall together (a fourth group), and claims 5, 6 and 24 stand or fall together (a fifth group).

H. ARGUMENT

1. First Group

Claims 1-4, 8 and 13-18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Scully in view of Uehara.

It is respectfully submitted that it would not have been obvious to a person of ordinary skill in the art to modify the system of Scully in view of Uehara because each of the Scully and Uehara systems are complete and therefore, one skilled in the art would not consider taking only one element from the Uehara system and using it in the Scully system.

In view of foregoing, it is respectfully submitted that the Examiner's rejection of claims 1-4, 8 and 13-18 under 35 U.S.C. §103(a) as being unpatentable over Scully in view of Uehara is untenable and should be removed.

2. Second Group

Claims 19, 20, 22, 28, 29 and 31 were rejected under 35 U.S.C. §103(a) as being unpatentable over Scully in view of Uehara and further in view of Spies.

It is an important feature of the embodiment of claim 19 that the identification or identity of the object in the blind spot is determined via analysis of images of the exterior environment of the vehicle, because only some objects would cause concern as other objects may properly be located in the blind spot. For example, if the car is traveling on a road close to a guard rail or trees, the blind spot detector in accordance with the invention would detect an object in the blind spot and provide this information to the driver. However, the guard rail and trees do not usually pose a direct threat to the safety of the vehicle if they are behind the vehicle and thus the presence of the guard rail and trees does not and should not be indicated to the driver. On the other hand, if the object were a vehicle, then the information about the presence of the vehicle in the blind spot should be provided to the driver to enable the driver to consider defensive action.

The processor is designed to process images from the receiver means to obtain an identification of the object so that the vehicular system can be controlled based on the identification. The identification may be performed using a trained pattern recognition algorithm incorporated into the processor such as a neural network whereby through training using images of different objects, the neural network is capable of identifying an object from an image derived during operation of the blind spot detector. The control of the vehicular system would thus vary depending on the whether the object is identified as a passive guard rail or as a potentially threatening vehicle.

Scully, Uehara and Spies do not disclose, teach or suggest any such identification of an object in a blind spot via image processing, and more specifically, receiver means for obtaining an image of the environment around the vehicle and a processor for determining the identification of the object based on the image and controlling a vehicular system based at least in part on the determined identification of the object.

Scully describes a method and apparatus for detecting objects in a blind spot of a driver in which the presence of an obstacle in the blind spot is detected and indicated on a display unit 300 to the driver. The display unit 300 includes LEDs which indicate power on, no obstacle in the sensing volume or an obstacle present in the sensing volume (col. 3, lines 17-23).

The system of Scully does not determine an identification of the object in the blind spot but rather simply the presence of an object in the blind spot. As such, innocuous, non-harmful objects may be detected and needlessly displayed to the driver by illuminating one of the LED's in the display unit 300. The driver cannot tell from the illumination of the LED's of Scully whether the object is likely to pose a threat that requires defensive action or is immovable and therefore does not require any defensive action.

Uehara describes a vehicle environment monitoring system in which an alarm is controlled based on the presence of objects in the environment. The distance between the vehicle and the objects and the direction in which the objects are located are determined and considered when sounding the alarm. An object identification means 13 provides an identification of the object based on the distance information

and the direction information. The detected configuration of distance and direction is compared to a predetermined reference configuration (see col. 16, lines 37-43).

In contrast to the claimed embodiment of the invention, Uehara does not include receiver means which obtain "at least one image of the environment around the vehicle" which is processed to determine the identification of any objects therein. There is absolutely no image formation and analysis steps in the Uehara object identification technique. Thus, the system of Uehara does not determine an identification of the object in the blind spot via image generation and analysis.

Spies describes a device for determining distances between a vehicle and objects. The device of Spies does not determine an identification of the object in the blind spot.

Accordingly, since Scully, Uehara and Spies do not disclose, teach or suggest creating images of a vehicular blind spot and analyzing them to identify objects therein, one could not combine these references and arrive at the embodiment of the invention set forth in claim 19, as well as the embodiments set forth in claims 20, 22-29 and 31 which depend directly or indirectly from claim 19.

In view of arguments presented above, it is respectfully submitted that the Examiner's rejection of claims 19, 20, 22, 28, 29 and 31 under 35 U.S.C. §103(a) as being unpatentable over Scully in view of Uehara and Spies is untenable and should be removed.

3. Third Group

Claim 9 was rejected under 35 U.S.C. §103(a) as being unpatentable over Scully in view of Uehara and claim 23 was rejected under 35 U.S.C. §103(a) as being unpatentable over Scully in view of Uehara and further in view of Spies.

In these embodiments, the processor utilizes a modular neural network to identify the object from which light is reflected. The Examiner remarked that it would have been obvious to know that the control unit of Scully can be used to utilize a modular neural network.

However, whether the control unit can be used to utilize a neural network is not believed to be the crux of an obviousness analysis. Rather, the issue is whether it would have been obvious to use a network.

Since Scully, Uehara and Spies does not disclose, teach or suggest trained pattern recognition techniques to identify the object, it certainly cannot support a position that it would have been obvious to use a particular form of a trained pattern recognition technique (a neural network) to identify an object.

In view of the foregoing, it is respectfully submitted that the Examiner's rejections of claims 9 and 23 are untenable and should be removed.

4. Fourth Group

Claims 10-12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Scully in view of Uehara and claims 25-27 were rejected under 35 U.S.C. §103(a) as being unpatentable over Scully in view of Uehara and further in view of Spies.

In these embodiments, the processor is arranged to create a three-dimensional map of a portion of the environment surrounding the vehicle. This feature is described in the specification, for example, at page 29, lines 5-30. Features are extracted from the map and used to generate icons to be displayed on a display (see Fig. 11 and as set forth in claims 11 and 12).

Scully, Uehara and Spies do not disclose, teach or suggest this feature. Moreover, it would not be obvious to use the processor to create a three-dimensional map in view of Scully, Uehara and Spies because these references do not mention anything to be gained by the creation of a map, i.e., there is no disclosure of a subsequent feature extraction from this map to generate icons to be displayed in a display. Thus, one skilled in the art would have no teaching or motivation from Scully, Uehara or Spies to create a three-dimensional map in view of any purported teachings of Scully, Uehara and Spies.

In view of the foregoing, it is respectfully submitted that the Examiner's rejections of claims 10-12 and 25-27 are untenable and should be removed.

5. Fifth Group

Claims 5 and 6 were rejected under 35 U.S.C. §103(a) as being unpatentable over Scully in view of Uehara and Smith et al. and claim 24 was rejected under 35 U.S.C. §103(a) as being unpatentable over Scully in view of Uehara, Spies and Smith et al.

The Examiner's rejections are respectfully traversed on the grounds that Smith et al. should not be available as prior art against the patentability of claims 5, 6 and 24. The present application claims the benefit of U.S. provisional patent application Ser. No. 60/202,424 filed May 8, 2000 under 35 U.S.C. §119(e) as set forth in the specification at page 1, lines 6-7. Smith et al. issued from U.S. patent application Ser. No. 09/689,411 filed October 12, 2000 after the filing date of the '424 provisional application. Therefore, Smith et al. should not be available as prior art against the patentability of claims 5, 6 and 24.

In view of the foregoing, it is respectfully submitted that the Examiner's rejection of claims 5, 6 and 24 are untenable and should be removed.

I. CONCLUSION

The prior art cited by the Examiner in the rejections of claims 1-6, 8-20 and 22-31 does not disclose essential features of the claimed embodiments of the invention and thus cannot be combined to render the claimed embodiments obvious and/or it would not have been obvious to one of ordinary skill in the art to combine the cited prior art in the manner suggested by the Examiner in order to arrive at the claimed embodiments of the invention. For example, the feature of image creation and analysis to identify objects in the blind spot (claims 19, 20, 22-29 and 31) is not found in any of the prior art cited in the rejections of the claims.

Therefore, upon reason and authority, it is respectfully requested that the board reverse all of the final rejections.

The fee of $165.00 for filing an Appeal Brief, appellants having qualified for small entity status, should be charged to Deposit Account No. 50-0266.

An early and favorable action on the appeal is earnestly solicited.

FOR THE APPELLANTS
Respectfully submitted,

Brian Roffe
Reg. No. 35,386

Brian Roffe, Esq.
11 Sunrise Plaza, Suite 303
Valley Stream, New York 11580-6111
Tel.: (516) 256-5636
Fax: (516) 256-5638

APPENDIX I

1. An arrangement for obtaining information about objects in an environment around a vehicle, comprising:

light emitting means arranged on the vehicle for emitting infrared light into the environment around the vehicle;

receiver means arranged on the vehicle for receiving infrared light from the environment around the vehicle;

measurement means coupled to said light emitting means and said receiver means for measuring time between emission of the infrared light by said light emitting means and reception of the infrared light by said receiver means whereby the measured time correlates to distance between the vehicle and an object from which the infrared light is reflected; and

a processor coupled to said receiver means and structured and arranged to determine an identification of the object from which light is reflected based at least in part on the received infrared light.

2. The arrangement of claim 1, wherein said light emitting means comprise an array of laser diodes.

3. The arrangement of claim 1, wherein said light emitting means comprise a pulsed laser.

4. The arrangement of claim 1, wherein said light emitting means comprise a continuous laser beam directing infrared light to scan in a line and means for controlling said scanning laser beam of infrared light such that the infrared light traverses a volume of space near the vehicle.

5. The arrangement of claim 4, wherein said receiver means comprise a single pixel receptor.

6. The arrangement of claim 1, wherein said receiver means comprise at least one of a CCD array, a CMOS array and an HDRC camera, a dynamic pixel camera and an active pixel camera.

8. The arrangement of claim 1, wherein said processor utilizes pattern recognition techniques.

9. The arrangement of claim 1, wherein said processor utilizes a modular neural network to identify the object from which light is reflected.

10. The arrangement of claim 1, wherein said processor is arranged to create a three-dimensional map of a portion of the environment surrounding the vehicle.

11. The arrangement of claim 10, wherein said processor is arranged to extract features from the three-dimensional map.

12. The arrangement of claim 11, further comprising a display visible to a driver of the vehicle for displaying features or representations derived from features extracted from the three-dimensional map.

13. The arrangement of claim 1, wherein said light emitting means and said receiver means are collocated.

14. The arrangement of claim 1, wherein said light emitting means comprise a plurality of light emitting elements and said receiver means comprise at least one light receiving element.

15. The arrangement of claim 14, wherein said light emitting elements and said at least one receiving element are spaced apart from one another.

16. The arrangement of claim 1, wherein said receiver means comprise a notch filter for filtering light other than infrared light emitted by said light emitting means.

17. The arrangement of claim 1, wherein said receiver means comprise a light valve.

18. The arrangement of claim 1, further comprising a processor coupled to said measurement means for determining distance between the vehicle and the object from which infrared light is reflected and velocity of the object based on a plurality of position measurements.

19. A system for controlling a vehicular system based on the presence of an object in an environment around a vehicle, comprising:

an arrangement for obtaining information about the object, said arrangement comprising

light emitting means arranged on the vehicle for emitting infrared light into the environment around the vehicle, and

receiver means arranged on the vehicle for receiving infrared light from the environment around the vehicle, said receiver means being arranged to obtain at least one image of the environment around the vehicle;

a vehicular system adapted to be controlled or adjusted upon the determination of the presence of an object in the environment around the vehicle and the identification of the object; and

a processor coupled to said arrangement and arranged to process said at least one image obtained by said receiver means and determine the identification of any objects in said at least one image, said processor being coupled to said vehicular system and arranged to control the vehicular system based at least in part on the determined identification of the object.

20. The system of claim 19, wherein said processor is arranged to measure time between emission of the infrared light by said light emitting means and reception of the infrared light by said receiver means whereby the measured time correlates to distance between the vehicle and the object from which the infrared light is reflected.

22. The system of claim 19, wherein said processor utilizes pattern recognition techniques to determine the identification of the object in said at least one image.

23. The system of claim 22, wherein said processor utilizes a modular neural network to identify any objects in said at least one image.

24. The system of claim 19, wherein said receiver means comprise at least one of a CCD array, a CMOS array and an HDRC camera, a dynamic pixel camera and an active pixel camera.

25. The system of claim 19, wherein said processor is arranged to create a three-dimensional map of a portion of the environment surrounding the vehicle based on the infrared light received by said receiver means.

26. The system of claim 25, wherein said processor is arranged to extract features from the three-dimensional map.

27. The system of claim 26, wherein said vehicular system is a display visible to a driver of the vehicle for displaying features or representations derived from features extracted from the three-dimensional map.

28. The system of claim 19, wherein said vehicular system is a steering wheel having an adjustable turning resistance.

29. The system of claim 19, wherein said vehicular system is at least one of an audio alarm and a visual warning viewable by a driver of the vehicle.

30. The arrangement of claim 1, wherein said receiver means are arranged to form at least one image of the environment around the vehicle, said processor being arranged to determine the identification of the object based on analysis of said at least one image and on the measured time between emission of the infrared light by said light emitting means and reception of the infrared light by said receiver means as measured by said measurement means.

31. The system of claim 20, wherein said processor is arranged to process said at least one image in combination with the distance between the vehicle and the object from which the infrared light is reflected to determine the identification of the object.